REMARKS

Claims 1, 3-9, 11-13, 15-18, 21, and 22 are pending.

Claims 1, 4-8, and 12 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Pat. No. 6,320,668 to Kim. Reconsideration of this rejection is respectfully requested.

Claim 1 recites an image correction method comprising, *inter alia*, "obtaining reference outputs from an image sensor using a color image array, said reference outputs being indicative of outputs for a plurality of known reference colors, said plurality of known reference colors including white, at least three primary colors, and at least two other non-primary colors," "determining an error measure for each of said plurality of known reference colors, said error measure representing a difference between said reference outputs and what would be expected for each of said reference outputs," "obtaining a single, color correction matrix...obtained by simultaneously minimizing each said respective error measure to obtain optimum overall correction for said plurality of known reference colors," and "applying said color correction matrix to an input image."

Kim discloses a color correction method in which a color correction coefficient matrix is derived from a spectral image and "optical density value[s] measured through the optical densitometer from the chromatic test pattern 12 of the test pattern 10" that are "stored in the reference colorimetric data storage unit 31." See col. 14, lines 5-8 of Kim. Kim then applies the color correction coefficient matrix that includes optical density information to an input image. Kim does not teach or suggest applying to an input image a "color correction matrix" "obtained by simultaneously minimizing each said respective error measure to obtain optimum overall correction for said plurality of known reference colors," where "each said respective error measure"

is determined "for each of said plurality of known reference colors, said error measure representing a difference between said reference outputs and what would be expected for each of said reference outputs," each of "said reference outputs" being obtained from "an image sensor using a color image array, said reference outputs being indicative of outputs for a plurality of known reference colors, said plurality of known reference colors including white, at least three primary colors, and at least two other non-primary colors." Kim does not teach or suggest the invention recited in claim 1.

The Office Action states that the embodiment of FIG. 4 in Kim discloses the use of a single correction matrix. Applicant respectfully disagrees.

Kim states that "[t]here are several *preconditions* for performing the color correction of the present invention. The first precondition is to have the test pattern 10 include the aforesaid achromatic color and chromatic colors. The second precondition is to store reference gray level data which is an optical density value and reference colorimetric data which is a tri-stimuli value of an XYZ color coordinate system of CIE, each measured through an optical densitometer and a colorimeter from the achromatic test pattern 11 and the chromatic test pattern 12 of the test pattern, and stored in respective storage media by accumulating in a database system." See Kim, col. 12, lines 31-34. The Office Action's interpretation is directly at odds with this statement of "precondition" in Kim. Claim 1 and its dependent claims 3, 4, 5, 15, 16, and 21 are patentable over Kim.

Claim 6 recites an image sensor apparatus comprising, *inter alia*, "an image processor, operating according to a single, color correction matrix." The color correction matrix is obtained by "simultaneously minimizing respective error measures, each said error measure representing a difference between a reference output for a known reference color from a color image array and what would be expected for

said reference output, said color correction matrix being obtained according to at least the color white, three primary colors, and at least two additional non-primary colors."

Kim teaches obtaining a color correction matrix from spectral imaging and optical densitometer readings. Kim does not teach or suggest "an image processor, operating according to a single, color correction matrix, the color correction matrix having been obtained by simultaneously minimizing respective error measures, each said error measure representing a difference between a reference output for a known reference color from a color image array and what would be expected for said reference output."

Claim 6 is patentable over Kim. Claims 7, 8, and 12 depend directly or indirectly from claim 6 and are patentable over Kim for at least the same reasons.

Claims 3, 9, 11, 13, 15-18, 21, and 22 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Kim in view of Japanese Pub. No. 02-074367 in the name of Yamaguchi. Applicant respectfully traverses this rejection.

Claims 3, 15, 16, and 21 depend directly or indirectly from claim 1. Claim 1 is patentable over Kim as advanced above. Yamaguchi has not been applied against claim 1. Even if Yamaguchi had been applied against claim 1 in combination with Kim, the deficiencies of Kim would not be overcome. Yamaguchi has been cited to provide weighting of important individual colors. Yamaguchi does not teach or suggest a modification to Kim to produce a method of applying to an input image a "color correction matrix" "obtained by simultaneously minimizing each said respective error measure to obtain optimum overall correction for said plurality of known reference colors," where "each said respective error measure" is determined "for each of said plurality of known reference colors, said error measure representing a difference

between said reference outputs and what would be expected for each of said reference outputs," each of "said reference outputs" being obtained from "an image sensor using a color image array, said reference outputs being indicative of outputs for a plurality of known reference colors, said plurality of known reference colors including white, at least three primary colors, and at least two other non-primary colors." Claim 1 and its dependent claims 3, 4, 5, 15, 16, and 21 are patentable over the proposed combination of Kim and Yamaguchi.

Claims 9, 11, 17, 18, and 22 depend directly or indirectly from claim 6. Claim 6 is patentable over Kim as advanced above. Yamaguchi has not been cited against claim 6. Even if Yamaguchi had been combined with Kim in rejection of claim 6, the deficiencies of Kim would not be overcome. Yamaguchi has been cited as providing individual color weighting. Yamaguchi does not teach or suggest how to modify Kim to produce "an image processor, operating according to a single, color correction matrix," the color correction matrix having been obtained by "simultaneously minimizing respective error measures, each said error measure representing a difference between a reference output for a known reference color from a color image array and what would be expected for said reference output, said color correction matrix being obtained according to at least the color white, three primary colors, and at least two additional non-primary colors." Claim 6 and its dependent claims 9, 11, 17, 18, and 22 are patentable over Kim in view of Yamaguchi.

Claim 13 recites a method of correcting an image from an image sensor comprising, *inter alia*, "obtaining a color correction matrix for said pixels, said color correction matrix being one which takes into account correction of incoming radiation for at least the color white, three primary colors, and two other non-primary colors by simultaneously minimizing error measures relative to each color." In addition, "respective error measures for said non-primary colors are weighted such that said

correction matrix corrects for some of said non-primary colors more than said primary colors." Each error measure represents "a difference between a reference output for a known reference color from a color image array and what would be expected for each of said reference outputs." The color correction matrix is applied to obtain "a subjectively color-corrected and white-balanced image directly from an input image."

Kim discloses a system that relies on a combination of spectral image data and optical densitometer data. Kim does not teach or suggest a color correction matrix in which "each error measure represent[s] a difference between a reference output for a known reference color from a color image array and what would be expected for each of said reference outputs," and "applying said color correction matrix to obtain a subjectively color-corrected and white-balanced image directly from an input image." Claim 13 is patentable over the proposed combination of Kim and Yamaguchi.

In view of the above remarks, applicant believes the pending application is in condition for allowance.

Dated: September 29, 2005

Respectfully submitted,

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